tecpro 2 by Canford

Mk 11 WIRELESS INTERFACE TW403

USER GUIDE

Product Code 27-403

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1.0 INTRODUCTION

The Tecpro wireless belt-pack system can be used to establish a full duplex wireless conference group of up to 6 personnel (This is reduced to 5 if a TW403 Wireless Interface is used as a 'bridge' to a wired system). The group can simultaneously talk and listen to all the other users within the same group. In addition, an un-limited number of listener-only belt-packs can be added to the system, useful for personnel who only need to monitor conversation within the group.

The system operates primarily on an EU licence exempt UHF frequency of 869.525 MHz with two alternative EU licence exempt frequencies provided within the 863 – 865 MHz band. Encrypted digital transmission technology is used for secure communication. Additional non EU frequencies are available for use in many countries worldwide. Approximate operational coverage is 300 - 400m depending on the environment - and the frequency selected. Please see the full technical specifications in Section 8.0

Major applications are in the theatre, conference, live performance and broadcast markets, though new applications are constantly emerging.

Please note that the latest Mk II versions are not backwards compatible with the previous Mk I versions – a different coding system is used.

2.0 BASIC OPERATION

The TW403 Mk II Wireless Interface enables a wired Tecpro group to be interfaced with a wireless Tecpro conference group. The TW403 acts as a 'bridge' between the two systems.

There are two XLRs on the side of the TW403 to enable the connection to an existing Tecpro wired system and also allow 'loop through' if it is needed. Please see figure 1 below.

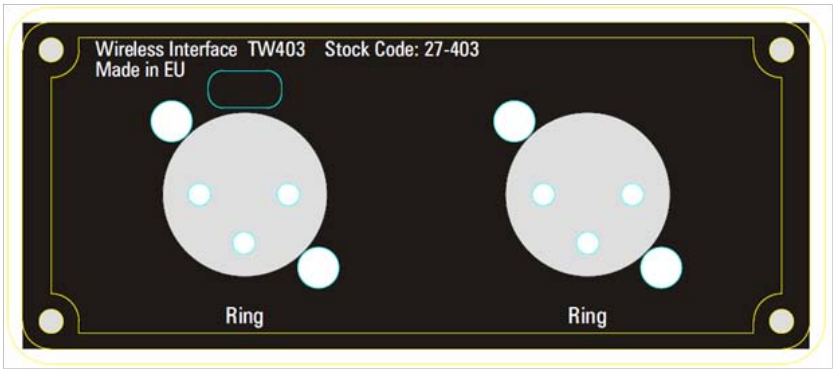

Figure 1 - XLR Interface To A Wired Tecpro System

The TW403 does not require to be powered separately, as it takes its power from the normal system Tecpro 24V DC system cabling

The top surface of the TW403 Mk II houses the control panel to configure functions such as frequency selection, setting the ID number, etc. The 02-127 TW401 Mk II data sheet (wireless belt-pack) goes into more detail - and all the same instructions apply - with only the following exceptions:

(a) The information screen is on all the time – it does not auto-dim
(b) The battery strength icon is removed – as system 24V DC is always present
(c) The headset audio output level icon is removed – it's not needed
(d) PTT is not implemented – not needed
(e) The antenna is now removable - and the housing has an SMA connector

2.1 Setting Up

First attach the supplied whip antenna (For enhanced coverage - the optional 27-412 TW412 Dipole antenna can be used, this has a 5m cable so it can be positioned remotely).

The TW403 has a chassis SMA connector for this RF connection.

Then power the TW403 up by plugging it into a Tecpro wired circuit, ensuring you are using the normal XLR3 wiring convention:

Pin 1 Screen
Pin 2 +24V DC
Pin 3 Audio

The TW403 will power up automatically and the blue display will illuminate.
Then it's necessary to configure the chosen working frequency as required - and also an ID number.

N.B. This procedure needs to be done just once as the units will remember their configuration – even if the power or battery is then removed.

The communication is UHF full duplex, using encrypted digital technology.

There is a choice of 3 frequencies – all are licence exempt in the EU.

The wireless conference group can now be able to talk to the wired users on the Tecpro circuit and vice versa.

2.2 Top Panel

There are 5 front panel keys that enable the selection and viewing of the various menu functions and their options. Please see figure 2 below.

Keys	Description
Start/Stop	Power ON/OFF
Menu	The menu key allows access to the configuration menu of the belt-pack. Also allows direct access to group selection.
+/-	In the setup menu of the belt-pack these keys adjust various parameters.
OK	Allows locking / unlocking of the keypad. In the setup menu of the belt-pack this button also allows you to accept the selected option, or exit the device configuration.

Figure 2 - Key Functions

2.3 Key Pad

The keypad is a touch sensitive type.

2.4 Turning On and Off

To turn the TW403 Mk11 on, press and hold the ON/OFF key for 2 seconds.

To turn the TW403 Mk II off, press and hold the ON/OFF key for 2 seconds.

2.5 Locking and Unlocking the Keypad

Press and hold the OK key for 2 seconds until the key symbol appears on the screen.
The keypad buttons are now locked to prevent accidental operation (except the ON/OFF key operation as described in Section 2.4).

To unlock the keypad, press and hold the OK key for 2 seconds until the ket symbol disappears.

N.B. The keypad is automatically locked each time the TW403 Mk II is switched on.

2.6 Screen Information

The screen displays the TW403 Mk11 current status and various other settings.
Please see Figures 3 and 4 below

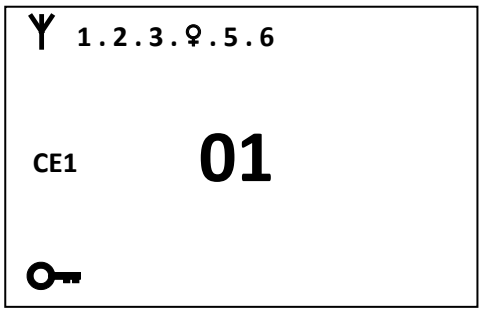

Figure 3 - Display

Icon	Description
01	**Belt-Pack Identifier Number** Indicates the belt-pack number in the conference group or if it is in listener mode.
Y 1.2♀4.5.6	**System Status** The ♀ icon indicates the location of the TW403 Mk11 in the conference group and the numbers indicate the other belt-packs in the same conference. A dash over the number indicates the particular belt-pack is in listener mode.
CE1	**Radio Channel Number** Indicates the selected radio channel number.
	Keypad Locked / Unlocked (N.B. The power ON/OFF function still operates).

Figure 4 - Screen Icon Information

2.7 Setting the Radio Channel for a Conference Group

To communicate, the belt-packs must be set to the same radio channel number. The primary channel is CE 1 - however alternative channels CE 2 and CE 3 are also available.

Procedure:
From the main screen, press and hold the Menu key for 2 seconds to access the user menu.
Use the + or - keys to access the sub-menu 'Channel'.

Press OK to confirm.

Select the channel by using the + or - keys. Please see Figure 5 below.

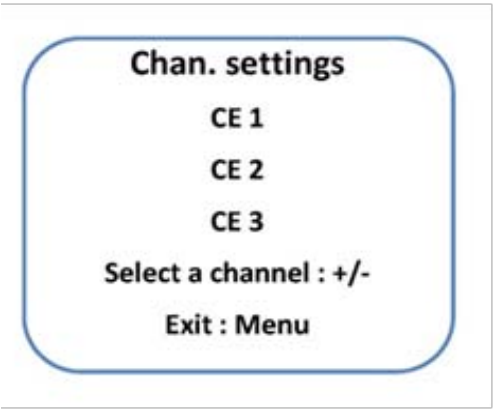

Figure 5 - Channel Group Selection

Press OK to confirm.
Press to return to the main screen.

2.8 Setting a Conference Group

To set up a conference group, each belt-pack needs to be configured as follows:
(i) Assign an identifier number to each belt-pack that will take part in the conference.
(ii) Enable the belt-packs to enter the conference.
N.B. Once these parameters are stored in the memory, they will remain the same, even if the belt-pack is switched off or the battery removed.

2.9 Assigning an Indentifier Number

To set up a conference group first decide the number of belt-packs that will take part in the conference and assign a unique number to each of them. There may be between 2 to 6 belt-packs in a conference group, (or up to 5 if a TW 403 Mk II is used as this will become one of the 'nodes').
The identifier numbers available are 01 to 06. Make sure each device has a unique identifier – don't assign several devices with the same identifier as this will prevent communication. N.B. One of the belt-packs or the TW403 Mk II must be set with identifier number 01. Please see figure 6 below.

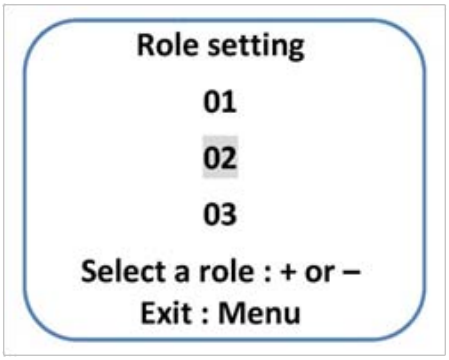

Figure 6 - Role Setting Screen

Procedure:
From the main screen, press and hold the menu key for 2 seconds to access the user menu.
Press the + or - keys to access the sub-menu 'Role Setting'.
Press OK to confirm.
Press the + or - keys to select the required ID.
Press OK to confirm.
Press to return to the main screen.

2.10 Enabling a Conference

To enable a conference group of belt-packs, they must communicate and memorise an encryption key transmitted by belt-pack 01. This operation is necessary to enable all the belt-packs to enter a conference or to add an additional belt-pack to a conference that has already been setup.

N.B. The devices can only communicate if this procedure, known as the 'encryption process', is performed. First make sure all belt-packs have a unique identifier number and that one has the identifier 01.

Procedure:
From the main screen on belt-pack 01 press and hold the menu key for 2 seconds to access the user menu.
Press the + or - keys to access the sub-menu 'Network'.
Press OK to confirm.
Press the + or - keys until the sub-menu 'Start' appears. Please see Figures 7 and 8.
Press OK to confirm.

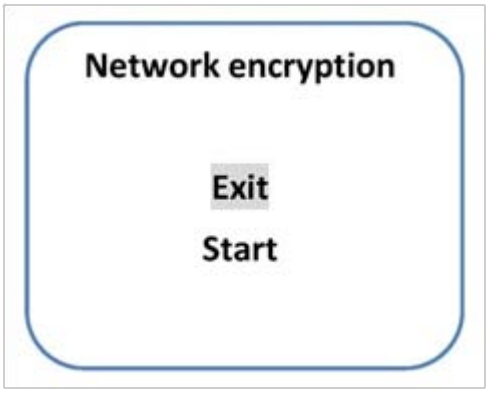

Figure 7 - Network Encryption

Figure 8 - Network Encryption - In Progress

Belt-pack TW403 Mk11 01 is now transmitting an an encryption key signal and displays the message 'Sending key.
Please wait until process has succeeded'.

Then, on all the other belt-packs in the conference group follow the same procedure and *SUCCEEDED* will appear on the other screens.

Then press OK to confirm on all the other belt-packs in the conference group.

Finally, when all the belt-packs have been enabled into the conference group, press OK on belt-pack 01 to end the procedure.

3.0 ADJUSTMENTS

N.B. The following audio level multi-turn trim potentiometer adjustments are set in the factory and would not normally need further adjustment – but can be adjusted if necessary by the user.

Input Level To Wireless, Output Level From Wireless, Main Null and HF Trim Null controls are available. Each control is discussed in more detail below.
Please see figure 9.

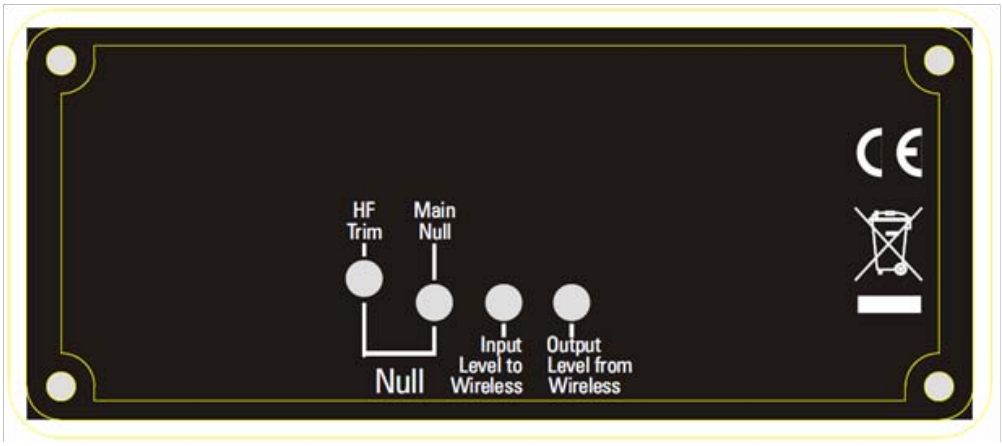

Figure 9 - Trim Potentiometer Location

3.1 Input Level To Wireless

This input level trim pot controls the level of audio from the Tecpro wired system that is sent onto the Tecpro wireless conference group. Turning this trim pot anti-clockwise reduces the level and when turned fully anti-clockwise the TW403 Mk II will eventually stop coding the audio. Please adjust this control as necessary so that the Tecpro wired audio is coded and can be heard clearly by listening to the results on a TW401 Mk II wireless belt-pack.

N.B. Do not turn this control excessively clockwise, as the audio will begin to sound distorted, please listen to the results by carefully monitoring on a TW401 Mk II wireless belt-pack.

3.2 Output Level From Wireless

This output level trim pot controls the level of audio from the Tecpro wireless conference group onto the Tecpro wired system. Please adjust this control as necessary so that the wireless conference group can be heard at a level that matches existing audio levels on the Tecpro wired part of the system.

3.3 Main Null

The purpose of the main null trim is to separate the input and output audio levels so that they do not interact with each other. (The length of Tecpro system cabling infrastructure connected will affect the position of this control – but it does have a nominal centre position).

If adjustment is needed first take a TW401 Mk II wireless belt-pack with a headset, then talk and listen using this equipment. If a slight 'echo' of your own voice is heard in your headset then the NULL control will need adjustment. Continue talking and listening using the same headset and then carefully adjust the NULL until the 'echo' is minimised to zero.

N.B. This is a fine adjustment using a multi-turn pot. (Please ensure that there are no other TW401 MK II wireless beltpacks with headsets and open mics in use in the same locality, as this will cause a confusing acoustic echo)

3.4 HF Trim Null

The HF null trim pot is an additional null control that operates in conjunction with the above main null trim pot to separate the input and output audio levels at higher frequencies. It has a nominal centre position.

4.0 OPERATIONAL FEATURES

4.1 Quick Channel Setting – 'Fast Channel'

If several Tecpro Wireless conference groups are used on the same site by using different radio channels, then it is possible – providing the encryption process is disabled, please see section 5.4 – to use the Fast Channel feature to switch from one radio channel to another. This may be the case, for example, if a team leader or director needs to move from one conference group to another within a venue.

N.B.

(i) This feature can only be used on CE channels – not Non-CE channels.

(ii) Do not assign the ID 01 to a belt-pack that will then subsequently change radio channels, as this will disrupt communication between the remaining members of that conference group. Each conference group must retain a belt-pack on ID 01 to enable continuous group communication. Please see figure 10.

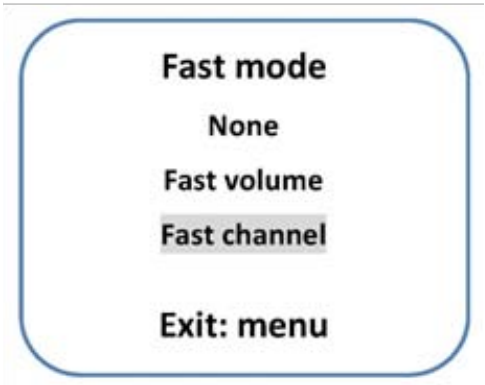

Figure 10 - Fast Channel Adjustment

Procedure:
From the main screen, press and hold the menu key for 2 seconds to access the user menu.
Press the + or - keys to access the sub-menu 'Fast Mode'.
Press OK to confirm.
Press the + or - keys to select 'Fast Channel'. Please see Figure 12.
Press OK to confirm.
Press to return to the main screen.

4.2 Using Fast Channel Mode

The use of Fast Channel can now be done directly via the + or – keys.

Procedure:

A short press of less than 1 second on the + or – keys will allow direct access to the channel choice.

Then select CE 01, CE 02 or CE 03 using the + or – keys

Press OK to confirm

N.B. It is only possible to activate one fast mode at a time. Fast Channel mode can't be activated at the same time as the Fast Volume mode.

To stop the Fast Channel mode, go back to the dedicated Fast Mode menu and choose the option 'None'.

5.0 ADVANCED SETTINGS MENU

N.B. The following menu would only normally made available to certain types of users - Technical Managers etc. Access to it requires a PIN access code available on request from Tech Support, Canford Audio Plc. Please be aware that it's possible to prevent the belt-packs communicating if the configuration is set incorrectly.

Tel +44 191 418 1144

E-mail: techsupport@canford.co.uk

The Advanced settings menu allows access to the following 5 sub-menus:

(i) Filter type

(ii) User Menu Locked

(iii) Encryption mode

(iv) Microphone settings

(v) AEC Filter

5.1 Using Advanced Settings

Entry of a PIN code is required. Please see Figure 11.

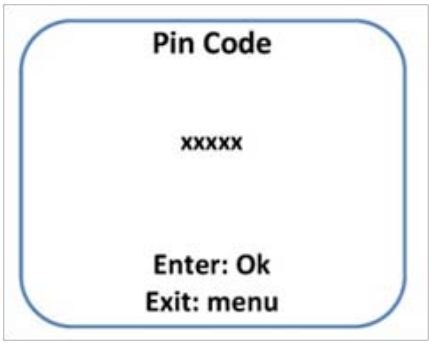

Figure 11 - Entering the PIN Code

Procedure:
From the main screen, press and hold the menu key for 2 seconds to access the user menu.
Press the + or - keys to go to the sub-menu 'Adv Settings'.

Press OK to confirm.

The belt-pack will now prompt you to enter a PIN code.

Enter the value of each digit using the + and - keys. Moving to the next digit is done by briefly pressing the ON/OFF key.

Once the full PIN code has been entered press OK.

5.2 Filter Type

Depending on the environment and the individual users preference, several types of filters are available. Please see figures 12 and 13.

Filter type	Applications / Designation
Generic	General use
Specific	Other noisy environments
No Filter	No filter
Generic (without mute)	General use, without mute
Specific (without mute)	Other noisy environments, without mute
No Filter (without mute)	No filter, without mute

Figure 12 - Filter Settings Table

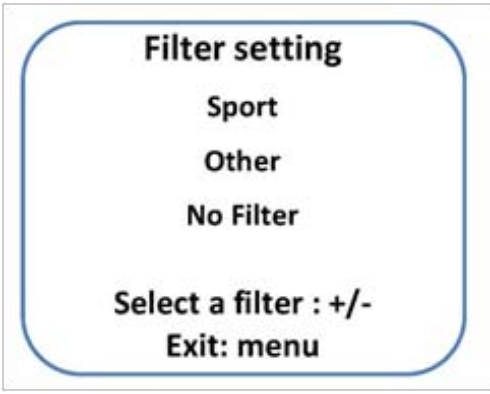

Figure 13 - Filter Settings Screen

Procedure:
From the main screen, press and hold the menu key for 2 seconds to access the user menu.
Press the + or - keys, select the 'Adv settings' menu.
Press OK to confirm.
Press the + or - keys in the sub-menu to select the required filter i.e. 'Generic'
Press OK to confirm.
Press to return to the main screen.

5.3 User Menu Locked Feature

This feature allows you to lock access to the main menu - if you do not want users to change the settings of the belt-packs. Please see figure 14.

N.B. If this feature is enabled, access to the main menu will only be authorised by inserting the PIN code.

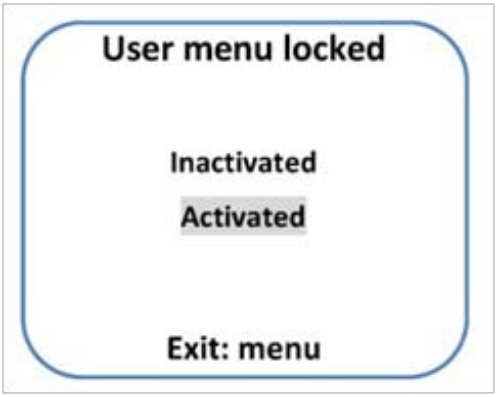

Figure 14 - User Menu Locked Screen

Procedure:
From the main screen, press and hold the menu key for 2 seconds to access the user menu.
Press the + or - keys to select the 'Adv Settings' menu.
Press OK to confirm.
Press the + or - keys to select the sub-menu 'User Menu Locked'.
Press OK to confirm.
Press the + or - keys to select 'Activated'.
Press OK to confirm.
Press to return to the main screen.

5.4 Disabling The Encryption Setting

In some instances it may be desirable to disable the encryption procedure. For example, when adding new belt-packs into a conference group - but without having to go through the encryption procedure as described in section 2.10

Typically, this would be where the different belt-packs are located a long distance apart from each other and it's not practical to bring them back together again for encryption and the introduction of additional belt-packs.

If encryption is disabled then an available ID needs to be chosen and the same radio channel as the existing conference used. Please see figure 15.

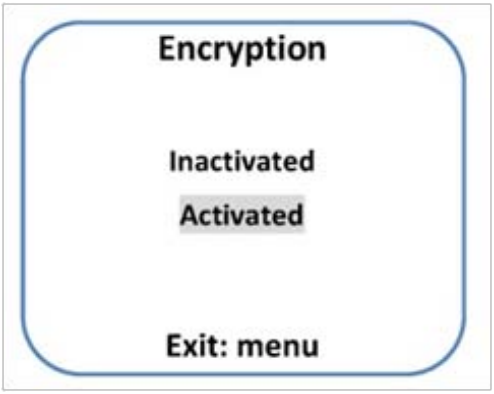

Figure 15 - Encryption Activation Screen

Procedure:
From the main screen, press and hold the menu key for 2 seconds to access the user menu.
Press the + or - keys to access the 'Adv Settings' menu.
Press OK to confirm.
Press the + or - keys to select 'User Encryption Mode'.
Press OK to confirm.
Press the + or - keys to select 'Inactivated'.
Press OK to confirm.
Press to return to the main screen.

N.B. If the encryption procedure is disabled, you can't ensure the security or confidentiality of your communications.

5.5 Microphone Gain Settings

The belt-pack has an embedded AGC on the microphone circuit – that allows the use of many types of headsets. However, it is possible to manually set both the DC polarisation and gain of the microphone in manual mode.

Polarisation settings: 0R, 680R, 2.7k, 5.4k

Gain values: 0dB, 6dB, 12dB, 18dB, 24dB

Please see figures 16, 17 and 18.

Procedure:
From the main screen, press and hold the menu key for 2 seconds to access the user menu.
Press the + or - keys to access the 'Adv Settings' menu.
Press OK to confirm.
Press the + or - keys to select the sub menu 'Mic Settings'.
Press OK to confirm.
Press the + or - keys to select 'Manual'.
Press OK to confirm.
Set the required Polarisation value and press OK to confirm.
Set the required Gain value and press OK to confirm.
Press to return to the main screen.

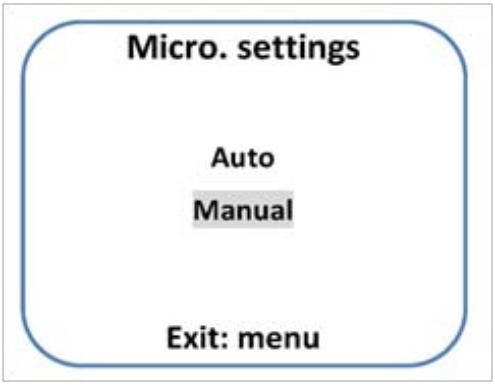

Figure 16 - Micro Settings Screen

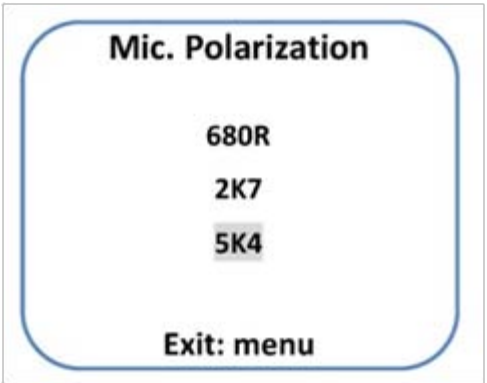

Figure 17 - Mic Polarisation Screen

Figure 18 - Mic Gain Screen

6.0 TROUBLESHOOTING

6.1 Can't Communicate With Other Beltpacks

Check all belt-packs are using the same radio channel number.

Check that one belt-pack is identified with the number 01 and that a conference group has been created. N.B. Do not assign the same identifier number to several belt-packs.

6.2 The Belt-Pack Cannot Enter A Conference

Check all belt-packs are using the same radio channel number.

Make sure all the belt-packs have been encrypted to enter the conference - especially if an extra belt-pack has been added to an existing conference.

6.3 The Belt-Pack Will Not Switch On

Check that the battery is charged and correctly inserted the right way round.

6.4 Communication Interference

Another conference system may be in use close to yours. Use the primary CE 01 radio channel - or switch to the alternative channels CE 02 or CE 03.

Make sure there is no contact between the belt-pack antenna and the headset cable.

6.5 Crackling Noises

The microphone of one of the belt-packs is probably damaged. Replace the headset or re- terminate the connector.

6.6 Echo Sounds

Check there is at least 10m between the belt-packs to prevent your voice being picked up on another headset boom mic.

6.7 The Keys Are Not Working Properly

Press the keys in the centre. Some functions require a key to be pressed and held for 3 seconds. Avoid pressing more than one key simultaneously.

7.0 ACCESSORIES

27-401	Tecpro TW401 wireless belt-pack
27-403	Tecpro TW403 wireless interface
27-415	Tecpro TW405 Battery charger 5-way
27-406	Tecpro TW406 Lightweight earpiece with boom mic
27-407	Tecpro TW407 Lightweight earpiece with boom mic and on/off switch
27-214	Tecpro SMH214 Single muff headset
27-224	Tecpro DMH224 Dual muff headset
27-408	Tecpro Spare 2600mAh rechargeable battery
27-409	Tecpro Spare belt clip for TW401

(Additional accessories will be made available as they are developed.)

8.0 TECHNICAL SPECIFICATIONS

8.1 27-403 TW401 Wireless Belt-pack

Harmonised Standards	Radio EN300-220
	EMC EN301-489
Frequencies	CE01 869.525 MHz, CE02 864.500 MHz, CE03 863.500 MHz
Modulation	GFSK
Data rate	115 kbits/sec "air-rate"
RF Power	200mW erp maximum - depending on channel selected (863-865 MHz band operates at a reduced power)
Useable distance	300 to 400m maximum - depending on the environment and the channel selected
Duty Cycle	< 10%
Conference Group	Up to 5 personnel - as the TW403 Mk II is a 'node'
Listen Only	Unlimited number of listeners
Protection Class	IP54 rated
Dimensions	60(w) X 22(d) X 120(h)mm
Weight	180g

8.2 27-214 SMH214 Single muff closed headset

Impedance	35 ohm
Microphone	Electret mic (2-10V DC)

8.3 27-224 DMH224 Dual muff closed headset

Impedance	2 X 35 ohm
Microphone	Electret mic (2-10V DC)